

Thinking Like a Scientist

Notes

Learning Objective: In writing, SWBAT sequence and explain the steps in experimental design using academic language in order to learn about the world around us

Descriptive design

research that involves observing and describing objects

Correlational design

research that involves studying the relationship between two or more things

Example: relationship between water and dead fish

Experimental design

research that involves carrying out scientific experiments

1. Make an **observation** and ask a **question**
2. Form a **hypothesis** and **predict** an ending
3. **Test** your hypothesis and gather **data**
4. **Analyze** the test results
5. Make a **conclusion** and communicate the results

Learning Objective: In writing, SWBAT apply their knowledge of experimental design to real-world situations using academic language.

Observation

to notice something

Observations can include things you see, touch, taste, smell or hear

Example: my cell phone is not working

Hypothesis

a possible explanation for an observation

It is not yet proved correct

Example: I think the battery needs to be charged

Prediction

what you think will happen

*Example: **IF** I charge the battery, **THEN** the phone will work*

Experiment

a scientific test of the hypothesis

Example: charge the battery

Data

information used by scientists

Example: the battery is charging

Analyze

to study carefully

Example: try to make a call or send a text

Conclusion

the result of the experiment

*Example: the phone works.
Charging the battery fixed it.*

If the hypothesis
IS correct

if the phone works, your
hypothesis is correct

Then you must repeat the
experiment a few more times

If the hypothesis
is NOT correct

if the phone does not work, you
must make a new hypothesis and
prediction

Then you must test your new
hypothesis

<http://www.brainpop.com/science/scientificinquiry/scientificmethod/>

Thinking Like a Scientist

Check Your Understanding

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1. What observation does the student make in the first picture?

In the first picture, the student observes _____ .

2. Was the hypothesis proved or disproved? How do you know?

The hypothesis was _____ because _____ .

3. How do scientists learn about the world around us?

Scientists learn about the world around us by using _____ , _____ , and _____ .

4. If the phone still doesn't work, what is another possible hypothesis?

If the phone still doesn't work, another possible hypothesis is _____ .

Learning Objective:

In writing, SWBAT describe relationships between organisms using academic language in order to understand the world around them.

Relationship

the way two organisms interact and the effect they have on each other

Example

the relationship between birds' beak types and the food they eat

Thinking Like a Scientist Science Skill

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1. What type of beak does a sparrow have? How is its beak type related to what it eats?

Sparrows have _____ beaks for _____ .

2. How is a woodpecker's beak type related to what it eats?

Woodpeckers have _____ beaks for _____ .

3. What type of beak do warblers have to catch and eat flying insects?

Warblers have _____ beaks for catching and eating flying insects.

Testable questions

scientists answer questions
that can be tested

Example: Which material
will keep ice frozen the
longest at 35°C?

Thinking Like a Scientist Check Your Understanding

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1. What is an example
of a descriptive design?

*An example of a
descriptive design is
observing and
describing*

_____ .

2. What does a
correlational design
look for?

*Correlational design
looks for _____ .*

3. What kinds of
questions do scientists
answer?

*Scientists answer
questions _____ .*

4. What is an example
of a question you could
test? How would you
test it?

*An example of a
question I could test
is, “ _____ ? ”
I would test it by*

_____ .